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CLAIMS

1. (Original) A device for measuring vibration in an article having a rotating member, the device comprising:

- a motion sensitive transducer attachable to the article comprising an output producing a time domain analog signal in response to the vibration;
- an analog-to-digital data acquisition member comprising an input connected to the transducer output for sampling the transducer signal and comprising an output producing a time domain digital signal from the sampling;
- a timing sensor adapted to detect an instantaneous speed of the rotating member and triggering the data acquisition member to begin sampling when the rotating member is rotating; and
- a processor comprising an input connected to the data acquisition member output for translating the time domain digital signal to a frequency domain digital signal and determining the magnitude and phase of the vibration signal at a frequency associated with the instantaneous speed of the rotating member.

2. (Original) The device of claim 1 wherein the processor further comprises a comparator determining whether the magnitude of the vibration signal at the frequency associated with the instantaneous speed of the rotating member is greater than a preselected threshold.

3. (Original) The device of claim 1 wherein the instantaneous speed is associated with a transient start up state of the article's rotating member and is less than the operating speed of the rotating member.

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4. (Original) The device of claim 1 comprising two transducers producing simultaneous vibration signals from different planes.
5. (Original) The device of claim 4 wherein the transducers are positioned orthogonally.
6. (Original) The device of claim 1 wherein the timing sensor comprises an optic sensor that is responsive to a target feature on the rotating member.
7. (Original) The device of claim 1 wherein the processor performs a Fourier transform in translating the signal from the time domain to the frequency domain.

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8. (Original) A rotating disc data storage device balancer for measuring vibration comprising:

- a motion sensitive transducer attachable to the data storage device comprising an output producing a time domain analog signal in response to the vibration;
- a timing sensor adapted to detect an instantaneous speed of the disc stack;
- and
- means for processing the transducer signal in determining a magnitude and phase of the signal at a frequency determined by the timing sensor.

9. (Original) The balancer of claim 8 wherein the means for processing is characterized by an analog-to-digital data acquisition member comprising an input connected to the transducer output for sampling the transducer signal and comprising an output producing a time domain digital signal from the sampling.

10. (Original) The balancer of claim 9 wherein the data acquisition member is triggered to begin sampling by the timing sensor when the disc stack begins rotating.

11. (Original) The balancer of claim 9 wherein the means for processing is characterized by a digital signal processor comprising an input connected to the data acquisition member output for translating the time domain digital signal to a frequency domain digital signal.

12. (Original) The balancer of claim 11 wherein the means for processing is characterized by a Fourier transformation.

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13. (Original) The balancer of claim 8 wherein the means for processing is characterized by a comparator determining whether the magnitude of the vibration signal at the frequency associated with the instantaneous speed of the rotating member is greater than a preselected threshold.

14. (Original) The balancer of claim 8 wherein the instantaneous speed is associated with a transient start up state of the article's rotating disc and is less than the operating speed of the disc.

15. (Original) The balancer of claim 8 comprising two transducers producing simultaneous vibration signals along different planes.

16. (Original) The balancer of claim 15 wherein the transducers are positioned orthogonally.

17. (Original) The balancer of claim 8 wherein the timing sensor comprises an optic sensor that is responsive to a target feature on the rotating member.

18 – 20. (Canceled)